Goddard Space Flight Center SPI

GSFC

Creating Your

Software Management Plan / Product Plan (SMP/PP)

Why do I need a documented plan?

Some (good) reasons for an SMP/PP

- **Assures that you:**
  - **Have considered all elements and processes needed to successfully manage your project**
  - **Take advantage of Lessons Learned from projects and project managers who have come before you**

  - **Have gotten buy-in (and feedback) for your approach from your key stakeholders, including**
    - Customers
    - Your team
    - Management

  - **Mechanism for obtaining approval and commitment to the plan**
  - **and…..**

Because NPR 7150.2 Requires a Documented SMP/Product Plan

2.2.1 The project shall develop software plan(s). **[SWE-013]** These include, but are not limited to:

a. *Software development or management plan.*

b. Software configuration management plan.

c. Software test plans.

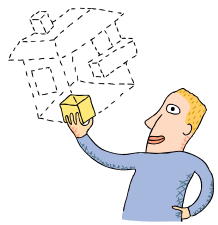
d. Software maintenance plans.

e. Software assurance plans.

Note: The requirement for the content of each software plan (whether stand-alone or condensed into one or more project level or software documents) is defined in Chapter 5 of 7150.2 (pp 26-27).

From Chapter 5 of NPR 7150.2

- The Software Development or Management Plan provides
  - insight into, and a tool for monitoring, the processes to be followed for software development
  - the methods to be used
  - the approach to be followed for each activity
  - and project schedules, organization, and resources.



- This plan details the system software, project documentation, project schedules, resources requirements and constraints, and general and detailed software development activities.

The SMP/PP Boilerplate

- **Planning is hard work – don't keep it all to yourself!**
- **Documenting your plan is also hard work – don't start with a blank sheet of paper ….**

The SMP/PP Boilerplate (Cont'd)

- **GSFC PAL contains a Boilerplate for a Software Management Plan/Product Plan (SMP/PP)***
  - **Outline, basic guidance, and NPR 7150.2- and CMMI-compliant text and tables**
  - **Output from SPI tools designed to be inserted into the SMP/PP Boilerplate**

- **For Acquisition projects**
  - **SPI is preparing a comparable boilerplate version of the requisite Software Acquisition Management Plan (SAMP).**

*http://software.gsfc.nasa.gov/toolsDetail.cfm?selTool=1.2.6.2

Your SMP/PP or the Boilerplate?

- **Already have a SMP/PP?**
  - **Use the SMP/PP Boilerplate to determine whether your SMP/PP is compliant with NPR 7150.2 and the CMMI**
    - Are all Boilerplate sections covered in your SMP/PP?
    - Are they covered adequately (i.e., do they cover the full text in the Boilerplate)?
    - Is your SMP/PP mapped back to the Boilerplate or 7150.2? (Full mapping to NPR 7150.2 included in the Boilerplate)
  - **Consider inserting your existing SMP/PP text into the Boilerplate text if that will be less work than enhancing your SMP/PP**
- **Don't already have an SMP/PP?** →

  - **Start with the SMP/PP Boilerplate !**
- **When you use text from the SMP/PP Boilerplate, first verify that it is consistent with your planned approaches / processes**

Boilerplate Section 1

1.0 Introduction

- 1.1 Background
- 1.2 Document Organization
- 1.3 Document Development, Review, Approval, and Update
- 1.4 References
  - 1.4.1 Planning Documents References
  - 1.4.2 Websites and Systems References

Boilerplate Section 2

2.0 Customer Agreement

- 2.1 Customer Identification
- 2.2 Customer-Supplied Elements
  - 2.2.1 Customer Requirements
  - 2.2.2 Customer Schedule
  - 2.2.3 Customer-Supplied Items
- 2.3 Resources Required
- 2.4 PDT, Customer, and Key Stakeholder Commitments
- 2.5 Acceptance Criteria
- 2.6 Customer Training
- 2.7 Post-Delivery Maintenance

Boilerplate Section 3

3.0 Software Management Approach

- **3.1 Product Development Team – Organization, Roles, Responsibilities, Tools, and Training**
- **3.2 Work Breakdown Structure**
- **3.3 Overall Schedule**
- **3.4 Project Measures**
- **3.5 Risk Management – Risk Strategy and Initial Risk Assessment**
- **3.6 Key Issues, Decisions, and Rationale**
- **3.7 Status Tracking and Management Review**
- **3.8 Software Safety Identification**
- **3.9 Lessons Learned**

Boilerplate Section 4

4.0 Software Acquisition Approach

- 4.1 Acquisition Management Approach
- 4.2 Acquisition Life Cycle and Processes
- 4.3 Acquisition of COTS Software and Hardware
- 4.4 Acquisition of Supplier-Built Custom Products
  - 4.4.1 Supplier Agreement
  - 4.4.2 Supplier Deliverables
  - 4.4.3 Government Furnished Equipment
  - 4.4.4 Identification and Traceability of Requirements for Acquired Software
  - 4.4.5 Process for Addressing Acquired Software Requirements Changes
  - 4.4.6 Supplier Performance, Progress, and Process Monitoring
  - 4.4.7 Acceptance of Acquired Technical Products
  - 4.4.8 Identification and Tracking of Supplier-Related Risks and Issues
  - 4.4.9 Process for Requesting Supplier Action
  - 4.4.10 Supplier Progress and Performance Reporting
  - 4.4.11 Acceptance Testing of Acquired Software
  - 4.4.12 Control of Acquired Software
  - 4.4.13 Integration of Acquired Software
  - 4.4.14 Transition of Acquired Software to Use

Boilerplate Section 5

- 5.0 Software Technical Approach
- 5.1 Development Strategy
  - 5.1.1 Project Life-Cycle
  - 5.1.2 Life Cycle Reviews
  - 5.1.3 Requirements Management and Traceability
  - 5.1.4 Build/Release Plan
  - 5.1.5 Make/Buy Approach
  - 5.1.6 Integration of Customer-Supplied and Acquired Products
  - 5.1.7 Rights and Approvals
  - 5.1.8 Technology and Commercialization Plan
- 5.2 Development and Test Environment
  - 5.2.1 Development and Test Facilities and Equipment
  - 5.2.2 Development and Test Processes, Software, and Tools
  - 5.2.3 Occupational Safety
  - 5.2.4 Security and Privacy
- 5.3 Verification and Validation Strategy
  - 5.3.1 Test Approach
  - 5.3.2 Peer Reviews / Inspections
  - 5.3.3 Statistical Techniques
  - 5.3.4 Prototyping
- 5.4 Product Delivery

Boilerplate Section 6

6.0 Product Control and Assurance

- **6.1 Data Management**
- **6.2 Configuration Management (CM)**
  - **6.2.1 Configuration Identification**
  - **6.2.2 Configuration Control**
  - **6.2.3 Configuration Status Accounting**
  - **6.2.4 Configuration Audits**
- **6.2 Control of Nonconforming Products and Corrective Action**
- **6.3 Control of Test Software and Hardware**
- **6.4 Control of Customer-Supplied Products**

Boilerplate Section 7

7.0 Quality Assurance

- **7.1 Software Quality Assurance Process**
- **7.2 Product Assessments**
- **7.3 Process Assessments**
- **7.4 Independent Verification and Validation (IV&V) Support**

Boilerplate Appendices

Appendix A. Acronyms

Appendix B. System/Subsystem Classifications

Appendix C. SMP/PP Compliance Matrix

Appendix D. Work Breakdown Structure

Appendix E. Data Management List

Appendix F. Measurement Data Collection and Storage Procedure

Appendix G. Measurement Analysis and Reporting Procedure

Tailoring Instructions Are Embedded

1.3 Document Development, Review, Approval, and Update

The plan described in this document was developed by the Product Development Lead (PDL) and reviewed and approved by signatories listed on the document's signature page.

This document presents a snapshot of planning information that is current at the time of signature. The PDL will maintain detailed cost, schedule and other planning information throughout the life-cycle. The planning information in this document will be updated when all signatories agree there is a change in cost, schedule or scope sufficient to merit a re-plan of the effort.

This document was developed in compliance with and includes the software management planning information required by Goddard Procedural Requirements (GPR) 8700.5, In-House Development and Maintenance of Software Products; design planning information required by GPR 8700.1, Design Planning and Interface Management, and the process management information required by GPR 8072.1, Process Control.

Upon approval, this document will be placed under configuration control. Approved changes will be listed in the document's Plan Update History located immediately after the signature page.

Do not tailor this section unless you want to add information. Retain all of the wording shown.

Follow the tailoring instructions … do not remove required text.

Add Information Where Requested

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3.5.2 Initial Risk Assessment

As part of the planning process, the PDL performed an initial risk assessment. The initial risks identified and analyzed during this process are listed in Table 3.5-1. All potential risks that have a credible possibility of impacting the timely delivery of high quality products have been considered. Additional risks will be added as identified. The detailed analysis information for these initial risks (e.g., each risk's source, category, exposure, timeframe, rank) has been recorded in the Risk Management Tool.

Table 3.5-1 Initial Risks

Risk ID	Risk Title	Risk Statement	Assigned Responsibility

Do NOT change the text in this section.

Insert the requested information about your initial risks in the table above. Make sure to also enter these initial risks and their associated details into your Risk Tool.

Fill in tables as directed.

Make Decisions About Your Approach

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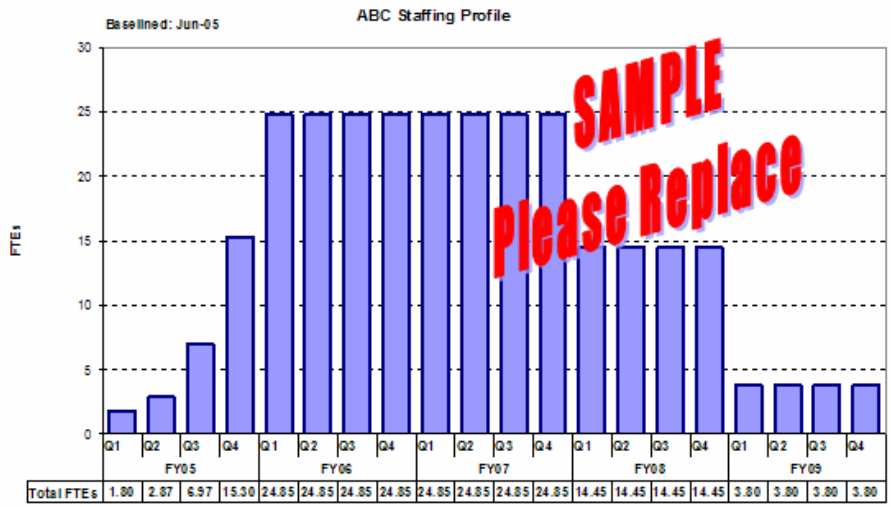
2.3.2 Planned PDT Resource Requirements

Staffing

PDT staffing requirements were derived using the process described in the previous section. Based on these requirements, the PDT staffing profile shown in Figure 2.3-1 is planned for this effort. An integrated team of both civil servant and contractor personnel are planned to comprise the PDT.

Figure 2.3-1 PDT Staffing Profile



If the PDT will consist of only civil servant personnel, change the last sentence to explicitly state that.

Delete the sample chart and insert the staffing profile for the PDT.

***Note**: The TOOLS section of the GSFC PAL provides a Staffing Tool that generates a staffing profile. If you use this tool, copy and paste the chart from the "Staffing Profile" tab in the tool here.*

If not using the tool, create and insert a chart showing the average full-time-equivalents per quarter planned for the life of your project.

Follow instructions where choices are provided.

Insert the Tables You Create that summarize various elements of your plan/approach

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Project Stakeholder Process Involvement Table

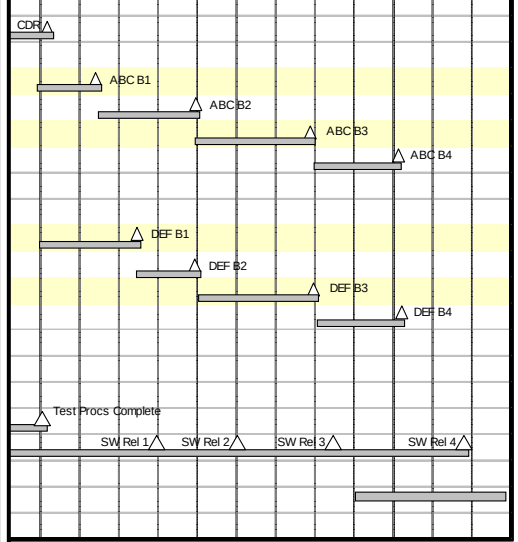
	Internal Stakeholders				External Stakeholders									
Involvement type: **Approval (A)** **Primary (P)** **Provide Input (I)** **Monitor (M)** **Review (R)**	**Team Lead**	**Developers**	**Testers**	**Configuration Manager**	**PPQA Personnel**	**SPI Quick Look Team (process audits)**	**Branch Management**	**Project Systems Engineer**	**IV&V Project Manager**	**Resource or Procurement Contact**	**Additional Stakeholder 1**	**Additional Stakeholder 2**	**...**	**Additional Stakeholder n**	**Involvement A**
Requirements Development															
Meet with Stakeholders to understand requirements															Meeting Attendance Sh
Software Requirements Review															
OPS Concept															
Requirement Documents Walkthroughs															
Obtaining Requirements Approval															
Requirements Management															
Maintain Requirements Traceability Matrix															

Y High Level Schedule

Project Y as of MM/DD/YY	FY05				FY06				FY07				FY08				FY09			
Baseline: 11/08/05	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS
Mission Milestones				S/C SRR	S/C PDR				S/C CDR			Start S/C I&T			FOR/ ORR	LRR	Launch		IOC	
Project Milestones				SW SRR	SW PDR				SW CDR					SW STRR	SW TRR	SW Launch Readiness				Turn-over To Maint
Project Management				PP (S)				Plan Review				Plan Review				Plan Review				
				ICDs(D)				ICDs (Submit to CM)								Launch Support				

<Product> Development Team Training Plan - Sample Template

Training	Risk Management Tool	CM/DCR Tool - e.g., MKS	Req. Mgmt. Tool - e.g., DOORS	Training Records Tool (opt.)	Tool Administration (All)	GFE, if applicable - e.g., ASIST	Specialized Training - e.g., GNC (opt.)	Electro-Static Discharge (opt.)	CMMI Overview and Best Practices	SPI Software Process Overview	SPI Advanced Process Overview	Process Workshops	SPI Software Engineering Seminars	Product Plan Walkthru (opt.)	SQA Plan Walkthru (opt.)	Schedule Walkthru (opt.)	Requirements Walkthru (opt.)	Test Plan Walkthru (opt.)
Provider	Branch/Org	Vendor	Vendor	Branch/Org	Branch/Org	GSFC	GSFC	GSFC	SPI	SPI	SPI	SPI	SPI	PDT	PDT	PDT	PDT	PDT
PDT Role																		
PDL	M	M	O	M				M	M	M	M	M	O	M	M	M	M	M
SE	O		O	M					M	M	M		O	M		O	O	
DTL	M	M	O	M		M	M	M	M	M	M	M	O	M	M	M	M	M
DE		M		M		M	M	M	O				O	M		M	O	M
TTL	O	M	O	M		M	M	M	M	M	M	M	O	M	M	M	M	M
TE		M		M		M	M	M	O				O	M		M	O	M
LM		M		M		M	M	M	O					M		M		M
STE		M		M		M	M	M	O					M		M		O
CMO		M	O	M	M			M	M	M	O			M	O	M		
SQE	O	O	O					M	M	M	M	O	O	M	M	M	M	M



Maintain Your Plan

- Review your SMP/PP in conjunction with all other plans (e.g., CM Plan, Test Plan) to ensure consistency among them.
- Completed SMP/PP needs to be reviewed and approved by at least:
  - PDL (if not the preparer)
  - Branch Head
  - Primary Customer
- Signatures signify approval AND commitment to the plan
- Review approved SMP/PP with all of your project members to ensure their awareness of its contents
- Maintain SMP/PP for the duration of the project.
  - Review and, as needed, update at least yearly
  - Review and, as needed, update at major milestones (e.g., PDR, CDR)
  - Review and, as needed, update when a change in cost, schedule or scope is sufficient to merit a re-plan of the effort

Keeping Records→ SMP/PP Preparation

- **Review versions of the SMP/PP (including red-lined versions)**
- **Approved, signed final version of the SMP/PP**
- **<u>Each</u> updated version of the SMP/PP**
- **Emails, meeting minutes, etc. documenting all reviews of the SMP/PP (including reviews by your project members)**
- **Reminder: The SMP/PP is a snapshot of many artifacts that are maintained apart from the plan itself (e.g., the DML, schedule)**

Summary

- **Documenting your approach to and plan for conducting the work of your team is an essential element of good management**
  - **You will find value is in thinking through all aspects of the work and making decisions on the "how we wills"…the boilerplate will help guide your thinking**
  - **Iterate on and review your initial approaches and plans with your team**
  - **Involve all major stakeholders to ensure "buy-in" and commitment to the plan**
  - **Update your approaches / plans when it is valuable to do so**

Questions?